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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,687	06/24/2005	Rob Otte	NL 021428	8981

24737 7590 11/12/2008

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
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EXAMINER	
NWAKAMMA, CHIBUIKE K	

ART UNIT	PAPER NUMBER
2627	

MAIL DATE	DELIVERY MODE
11/12/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/540,687	**Applicant(s)** OTTE ET AL.	
	Examiner CHIBUIKE K. NWAKAMMA	**Art Unit** 2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _08 August 2008_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1,2 and 4-16_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1,2 and 4-16_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. The RCE filed on 9/9/08 is acknowledged.

2. The disclosure is objected to because of the following informalities: The specification does not show the headings for Background of Invention, Brief Summary of Invention, Brief Description of Drawings, and Detailed Description of Invention. Appropriate correction is required.

3. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
I STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
(f) BACKGROUND OF THE INVENTION.
(1) Field of the Invention.
(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
(g) BRIEF SUMMARY OF THE INVENTION.
(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
(i) DETAILED DESCRIPTION OF THE INVENTION.
(j) CLAIM OR CLAIMS (commencing on a separate sheet).
(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a

nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Claim Objections

4. Claim 8 is objected to because of the following informalities: Line 4 recite "at least once switch for". Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-2, 8, and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kojima (US 6118613) in view of Matoba et al (US 5301174).

Regarding claim 1, Kojima teaches a method for driving an actuator (Figs. 5-6, elements 100, 1 provides method of driving an actuator), the method comprising the act of changing electrical damping 36 of the actuator 1 by selectively activating at least one switch 47 for switching in or out an electrical damping element 36 providing a negative resistance (Fig. 5 and Col. 12, lines 10-15, 24-40. The impedance circuit 47 is equated as a switch and is a component of the electrical damping element (negative resistance circuit 36). An activation process is attained when the capacitor is considered open (i.e., switching out), thereby changing element 36 into short-circuit. Negative resistance is

provided, see formulae 19). However, does not disclose in response to a control signal from a controller.

Matoba teaches an actuator driving circuit 17 receiving/responding to a control signal via jump control circuit 19, tracking control circuit 18, objective lens control circuit 16, sw2, and CPU 5 (Fig. 2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kojima to include the teachings of Matoba where the electrical damping of a driving actuator is selectively activated in response to a control signal from a controller. The modification would have been obvious for the benefit of compensating to generate an error signal so that a lock control is performed on objective lens thereby preventing the objective lens from oscillating at the position of the designated track, that is, damped oscillation (Matoba; col. 7, lines 5-14).

Regarding claim 2, Kojima in view of Matoba teaches the method of claim 1.

Kojima further teaches wherein the electrical damping of the actuator (Fig. 5, elements 36, 1) is changed by changing an electrical resistance of an actuator drive loop (Col. 12, lines 63-67...current value of actuator is varied by R_c. It is clear that the value of R_c changes where R_c represents the electrical resistance of the actuator drive loop).

Regarding claim 8, Kojima teaches an actuator driver circuit (Fig. 5, elements 100, 1) comprising:

a variable negative internal resistance (R_n) including an input resistor (R_i), a first resistor R and a second resistor R_o; and

at least one switch (Fig. 5, element 47) for selectively connecting the input resistor (R_i) to at least one of the first resistor R and the second resistor R_o (Formulae 19; Col. 12, lines 10-15, 24-40; The impedance circuit 47 is equated as a switch for when capacitor C_i is considered open (i.e., switching out), the circuit is short-circuited. So, it is clear that when the capacitor is not open (i.e., switching in), the circuit is not short-circuited. The process of short-circuiting and non-short circuiting is a selective means). However, does not teach in response to a control signal from a controller.

Matoba teaches an actuator driving circuit 17 receiving/responding to a control signal via jump control circuit 19, tracking control circuit 18, objective lens control circuit 16, sw2, and CPU 5 (Fig. 2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kojima to include the teachings of Matoba where the electrical damping of a driving actuator is selectively activated in response to a control signal from a controller. The modification would have been obvious for the benefit of compensating to generate an error signal so that a lock control is performed on objective lens thereby preventing the objective lens from oscillating at the position of the designated track, that is, damped oscillation (Matoba; col. 7, lines 5-14).

Regarding claim 15, Matoba further discloses a disc drive apparatus for reading or writing a disc (Fig. 2 and col. 1, lines 6-10), the apparatus comprising a pickup element 10 and at least one actuator 14 for manipulating the pickup element 10;
wherein the disc drive apparatus (Fig. 2) comprises the actuator driver circuit 17 according to claim 8.

Regarding claim 16, Kojima in view of Matoba teaches the disc drive apparatus according to claim 15.

Matoba further teaches wherein said pickup element 10 is an objective lens of an optical system for scanning tracks of an optical disc (col. 6, lines 66-67…objective lens installed in the optical head; col. 1, lines 6-11).

7. Claims 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matoba et al (US 5301174) in view of Kojima (US 6118613).

Regarding claim 9, Matoba discloses an actuator driver circuit (Fig. 2, element 17) for actuating an actuator having a first terminal b and a second terminal a, the actuator driver circuit 17 comprising a drive signal source connected to the first terminal b of the actuator (Fig. 2, elements 8-9 and col. 6, lines 43-49; It is clear elements 8-9 is connected to the first terminal b via elements 10 and 18). However, does not teach an electrical damping element having a negative resistance connected between the second terminal of the actuator and ground.

Kojima teaches an actuator driver circuit (Fig. 5, elements 100, 1) comprising an electrical damping element (Fig. 5, element 36) having a negative resistance (Col. 12, lines 35-40) connected between a terminal (terminal voltage E) of the actuator (Fig. 5, element 1) and ground.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Matoba to include the teachings Kojima where an electrical damping element having a negative resistance is connected between the second terminal of the actuator and ground, so, to suppress mechanical resonance and to form negative resistance between the negative input terminal of the operational amplifier and ground (Kojima; col. 1, lines 7-8 and col. 6, lines 1-3).

Regarding claim 10, Matoba in view of Kojima teaches an actuator of claim 9. Kojima further discloses controllable means (Fig. 5, element 47. The capacitor 49Ci is part of the negative resistance circuit 36, i.e., electrical damping element, it can be considered open hence, current does not flow [col. 12, lines 13-14] in which case short-circuit occurs [col. 12, line 25]. It is clear that the capacitor acts as a switch as it has the capability of being considered open/not open) for selectively switching said electrical damping element into or out of a signal path from the actuator (Fig. 5, element 1) to the ground.

Regarding claim 11, Matoba in view of Kojima teaches an actuator of claim 9. Kojima further discloses controllable means (Fig. 5, element 47. The capacitor 49Ci is

part of the negative resistance circuit 36, i.e., electrical damping element, it can be considered open hence, current does not flow [col. 12, lines 13-14] in which case a short-circuit occurs [col. 12, line 25]. It is clear that the capacitor acts as a switch as it has the capability of being considered open/not open) for selectively switching components of said electrical damping element into or out of operation in order to adjust damping properties of the electrical damping element (Fig. 5, element 36).

Claim 12 is an apparatus claim correspondent to apparatus claim 9. Therefore, claim 12 is analyzed and rejected as previously discussed with respect to claim 9.

Regarding claim 13, Matoba in view of Kojima teaches an actuator of claim 12.

Kojima further discloses controllable means (Fig. 5, element 47. The capacitor 49Ci is part of the negative resistance circuit 36, i.e., electrical damping element, it can be considered open hence, current does not flow [col. 12, lines 13-14] in which case short-circuit occurs [col. 12, line 25]. It is clear that the capacitor acts as a switch as it has the capability of being considered open/not open) for selectively switching said electrical damping element into or out of a signal path between the second terminal (terminal voltage E) of the actuator (Fig. 5, element 1) and the ground.

Regarding claim 14, Matoba in view of Kojima teaches the actuator of claim 12.

Kojima further discloses controllable means (Fig. 5, element 47. The capacitor 49Ci is part of the negative resistance circuit 36, i.e., electrical damping element, it can

be considered open hence, current does not flow [col. 12, lines 13-14] in which case a short-circuit occurs [col. 12, line 25]. It is clear that the capacitor acts as a switch as it has the capability of being considered open/not open. When the capacitor is open/not open, damping properties of element 36 are adjusted) for selectively switching components of said electrical damping element into or out of operation in order to adjust damping properties of the electrical damping element.

8. Claims 4-5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kojima (US. 6118613) in view of Matoba et al (US 5301174) and Hammond et al (US 5635848).

Regarding claim 4, Kojima in view of Matoba discloses the method of claim 1.

Kojima further discloses wherein the electrical damping of the actuator (Fig. 5, elements 100 and 1) deviates from a target position and wherein the electrical damping of the actuator has recovered the target position (Col. 11, line 18-Col. 13 line 7. When a circuit is shorted, i.e., Open, a target position or path has been deviated to another position or path. And when the circuit is not in a shorted state, i.e., Closed, or it is un-shorted, then it has recovered the target position. The state of being shorted read on target position during normal operative condition and the state of not being shorted read on recovered target position during normal operative condition).

Kojima in view of Matoba does not disclose wherein the electrical damping of the actuator is increased or decreased.

Hammond discloses wherein the electrical damping of the actuator is increased or decreased (Col. 9, lines 3-24. When the position error of the actuator, i.e. focus error, is greater than the reference value error, i.e., threshold, then, the electrical damping of actuator is increased and vice-versa).

Therefore, it would have been obvious to one of ordinary skill in the art to modify Kojima in view of Matoba with the teachings of Hammond by disclosing wherein the electrical damping of the actuator is increased with respect to the damping during normal operative conditions when an actuator position deviates from a target position, and wherein the electrical damping of the actuator is decreased to the normal damping when the actuator has recovered the target position, so, to control the speed at which the probe is actuated as well as the motion characteristics of the actuator in an open loop system, thereby preventing damage to the surface and a worst-case allowance for settling time because the actual position of probe is not known. Moreover, in a close loop system avoiding high frequency scraping of surface while the system oscillates to make positional corrections (Hammond; Col. 1, line 61-Col. 2, line 13).

Regarding claim 5, Kojima in view of Matoba discloses the method of claim 1, applied in an optical disc drive for radially driving an objective lens radial actuator (Matoba; Fig. 2, elements 17, 14-15, and 10; col. 1, lines 6-11…optical disk recording and reproducing apparatus; col. 6, lines 66-67…objective lens installed in the optical head; and col. 5, lines 15-20). But, does not disclose wherein the electrical damping of the radial actuator is increased when a radial error signal indicates a radial error

exceeding a predefined threshold, or when the radial error signal becomes absent; and wherein the electrical damping of the radial actuator is decreased to the normal damping when the radial error signal indicates said radial error decreasing below said predefined threshold, or when the radial error signal returns, respectively.

Hammond discloses position error Xerr, of actuator, i.e., radial error greater than a reference value, Xerr, i.e., predefined threshold (Col. 9, lines 3-24), and position error Xerr, of actuator, i.e., radial error less than a reference value, Xerr, i.e., predefined threshold (Col. 9, lines 3-24).

Therefore, it would have been obvious to one of ordinary skill in the art to modify Kojima in view of Matoba with the teachings of Hammond by disclosing electrical damping of the focus actuator being increased when a focus error signal exceeds a predefined threshold and electrical damping of the focus actuator being decreased when the focus error signal decreases below said predefined threshold, so, to control the speed at which the probe is actuated as well as the motion characteristics of the actuator in an open loop system, thereby preventing damage to the surface and a worst-case allowance for settling time because the actual position of probe is not known. Moreover, in a close loop system, avoiding high-frequency scraping of surface while the system oscillates to make positional corrections (Hammond; Col. 1, line 61-Col. 2, line 13).

Regarding claim 7, Kojima in view of Matoba discloses the method of claim 1, applied in an optical disc drive for radially driving an objective lens radial actuator

(Matoba; Fig. 2, elements 17, 14-15, and 10; col. 1, lines 6-11…optical disk recording and reproducing apparatus; col. 6, lines 66-67…objective lens installed in the optical head; and col. 5, lines 15-20).; and further teaches track jumping in accordance to positive and negative acceleration patterns of optical head during coarse access operation (Matoba; col. 1, lines 18-23 and 35-46; col. 5, lines 33-41). But, does not disclose wherein the electrical damping of the actuator is increased, and wherein the electrical damping of the actuator is decreased to the normal damping when the new target track has been reached.

Hammond discloses wherein the electrical damping of the actuator is increased and wherein the electrical damping of the actuator is decreased (Col. 9, lines 3-25. When the position error of the actuator (focus error) is greater than the reference value, (threshold) then, the electrical damping of actuator is increased and vice- versa).

Therefore, it would have been obvious to one of ordinary skill in the art to modify Kojima in view of Matoba with the teachings of Hammond where electrical damping of the actuator is increased in response to a command indicating a jump to another track and electrical damping of the actuator is decreased to the normal damping when the new target track has been reached, so, to control the speed at which the probe is actuated as well as the motion characteristics of the actuator in an open loop system, thereby preventing damage to the surface and a worst-case allowance for settling time because the actual position of probe is not known. Further, to avoid in a close loop system, high frequency scraping of surface while the system oscillates to make positional corrections (Hammond; Col. 1, line 61-Col. 2, line13).

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kojima (US 6118613) in view of Matoba et al (US 5301174) and further in view of Enomoto (US 4783774) and Hammond et al (Patent No. 5635848).

Regarding claim 6, Kojima in view of Matoba discloses the method of claim 1.

Kojima in view of Matoba does not disclose an optical disc drive for axially driving an objective lens focus actuator, wherein the electrical damping of the focus actuator is increased when a focus error signal indicates a focus error exceeding a predefined threshold, or when the focus error signal becomes absent; and wherein the electrical damping of the focus actuator is decreased to the normal damping when the focus error signal indicates said focus error decreasing below said predefined threshold, or when the focus error signal returns, respectively.

Enomoto discloses optical disc drive (Fig. 4 and Col. 5, lines 10-12) for axially driving an objective lens focus actuator (Col. 7, lines 33-59).

Therefore, it would have been obvious to one of ordinary skill in the art to modify Kojima in view of Matoba with the teachings of Enomoto to disclose an optical disc drive for axially driving an objective lens focus actuator, so, to achieve higher efficiency of a power conversion from electric energy to kinetic energy when pulse width modulation technique is a applied (Enomoto; Col. 2, lines 53-58).

Kojima in view of Matoba and Enomoto does not disclose, wherein the electrical damping of the focus actuator is increased when a focus error signal indicates a focus error exceeding a predefined threshold, or when the focus error signal becomes absent;

and wherein the electrical damping of the focus actuator is decreased to the normal damping when the focus error signal indicates said focus error decreasing below said predefined threshold, or when the focus error signal returns, respectively.

Hammond discloses position error Xerr, of actuator, i.e., focus error greater than a reference value, Xerr, i.e., predefined threshold (Col. 9, lines 3-24), and position error Xerr, of actuator, i.e., focus error less than a reference value, Xerr, i.e., predefined threshold (Col. 9, lines 3-24).

Therefore, it would have been obvious to one of ordinary skill in the art to modify Kojima in view of Matoba and Enomoto with the teachings of Hammond by disclosing electrical damping of the focus actuator being increased when a focus error signal exceeds a predefined threshold and electrical damping of the focus actuator being decreased when the focus error signal decreases below said predefined threshold, so, to control the speed at which the probe is actuated as well as the motion characteristics of the actuator in an open loop system, thereby preventing damage to the surface and a worst-case allowance for settling time because the actual position of probe is not known. And in a close loop system, avoiding high-frequency scraping of surface while the system oscillates to make positional corrections (Hammond; Col. 1, line 61-Col. 2, line 13).

Response to Arguments

10. Applicant's arguments filed 08 August 2008 with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection.

On page 8 of applicant's remark, applicant argued "In the Final Office Action, the Examiner objected to the specification for lacking headings. Applicants respectfully decline to add the headings as they are not required in accordance with MPEP §608.01(a), and could be inappropriately used in interpreting the specification. Accordingly, withdrawal of the objection to the specification is respectfully requested".

The Examiner notes applicant's argument, however, 37 CFR 1.77(b) and (c) indicates adding section headings of the specification sections defined in paragraphs (b)(1) through (b)(12).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chibuike K. Nwakamma whose telephone number is 571-270-3458. The examiner can normally be reached on Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Nguyen can be reached on 571-272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
Informati6on regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. K. N./

Examiner, Art Unit 2627

03 November 2008

/HOA T NGUYEN/

Supervisory Patent Examiner, Art Unit 2627